

REMARKS

The acceptance by the Examiner of the drawings filed with the application is noted with appreciation.

The acknowledgment by the Examiner of Applicants' claim for foreign priority under 35 U.S.C. §119 and receipt of the certified copy of the priority document is also noted with appreciation.

The title has been amended as required by the Examiner. The title, as amended, is descriptive of the invention claimed in the elected claims.

The specification has been carefully reviewed and minor spelling, typographical and punctuation errors have been corrected by this amendment.

Claims 7 to 9 and 16 to 26 are pending in the application. Claims 7 to 9 and 16 to 18 stand withdrawn from further consideration as drawn to a non-elected invention. Claims 19 to 22 have been amended and new claims 24 to 26 have been added by this amendment.

With reference to Figure 1, each recording layer of the medium 10 has a control area 21 and a data recording area 22 in a radial direction of a disk surface from a disk center 20 to a disk edge 23. In the data recording area 22, data recorded by a user of the disk is recorded. The control area 21 also functions as a recording management area. In the control area 21, recording layer management information containing at least information indicating a recording state of each of a plurality of areas into which the data recording area 22 of the first recording layer 12 is divided is stored. The recording layer management information of the data recording area 22 of the first recording layer 12 is stored not only in the control area 21 of the first recording layer 12 but also in the control area 21 of the second recording layer 14.

In the first recording layer 12, transmittances are usually different between an area in which recording has been performed and an area in which no recording has been performed. Physically, a phase state change of the recording layer, a refractive index change, a shape change, a phase change, a structural change or the like occurs. In terms of a laser wavelength alone, however, it is a phenomenon that the change is optically seen as a change in transmittance. For example, in the case

of the write-once type recording film in which a transmittance of a recorded part having a recording mark formed therein increases in comparison with that of an unrecorded part, the amounts of lights reaching the second recording layer 14 are different between a case in which the light passes through the unrecorded part of the first recording layer 12 to reach the second layer 14 and a case in which the light passes through the recorded part of the first recording layer 12 to reach the second layer. This means that when recording is performed, even if a laser beam of a similar output is emitted from a laser beam source side, a difference is generated in the amounts of lights reaching the second recording layer 14 depending on the recording state of the first recording layer 12. When reproducing is performed, depending on the recording state of the first recording layer 12, even if a laser beam of a similar output is emitted from the laser beam source side, a difference is generated in the amounts of lights that reach the second recording layer 14 and are reflected and received. In short, in the conventional medium, phenomena such as irregular recording, recording loss and reproducing failures easily occur, making it difficult to obtain reliability of recording and reproducing.

According to the disclosed and claimed invention, the recording layer management information of the first recording layer 12 is stored and when recording or reproducing is performed on the second recording layer 14, it is not necessary to move a focus of a laser beam to the first recording layer 12 by layer jumping, making it possible to quickly check the recording layer management information in the same recording layer. The recording state of the first recording layer 12 is checked based on the recording layer management information, and power reaching the second recording layer 14 can be adjusted to be equal by adjusting laser power based on the recording state of the first recording layer 12. Further, according to the medium 10, when recording or reproducing is performed on the second recording layer 14, a laser beam of relatively high intensity passes through the first recording layer 12. Accordingly, in this case, a possibility of losing the recording layer management information because of data rewriting may be relatively high in the first recording layer 12. Thus, for the recording layer management information of the first recording layer 12, the same data is recorded in the control area 21 of the second recording layer 14 in which the

aforementioned rewriting is difficult to occur, making it possible to disperse risks of losing the recording layer management information.

The invention also includes defect management information indicating a defect position of the data recording area 22 of each recording layer is stored in the control area 21. The defect management information of the first recording layer 12 is stored not only in the control area 21 of the first recording layer 12 but also in the control area 21 of the second recording layer 14. Defects (defective parts) of the optical information recording and reproducing medium generally occur because of certain non-uniformities, for example, presence of stuck things, a shape abnormality of the guide groove, exfoliation of the recording film, incursion of impurities into the substrate, and the like. These defects cause laser beam scattering, affecting a transmittance of the laser beam. That is, if there is a defect in the first recording layer 12, recording and reproducing on the second recording layer 14 will be affected. Accordingly, by managing the defect management information of the first recording layer 12, and by using a predetermined method described later, it is possible to suppress the influence of the defect in the first recording layer 12 on the recording and reproducing on the second recording layer 14. Moreover, by storing the defect management information of the first recording layer 12 in the control area 21 of the second recording layer 14, as in the case of the recording layer management information, it is possible to quickly check the information and to disperse risks of losing the defect management information.

In the practice of the invention, information indicating a recording state, a combination of recording layer number, start address of recorded part, and end address of recorded part, or a combination of recording layer number, target area number, start address of recorded part, and end address of recorded part may be employed. Defect management information contains a combination of kind of information: recorded information or defect information, target area number, start address of recorded part, end address of recorded part, start address of recording inhibited part due to defect, and end address of recording inhibited part due to defect, or a combination of flag indicating defect information, target area number, start address of recording inhibited part due to defect, and end address of recording inhibited part due to defect.

When management is performed based on a radial position of an optical head used for recording and reproducing, a combination of recording layer number, start radius of recorded part, and end radius of recorded part, or a combination of recording layer number, target area radius, start radius of recorded part, and end radius of recorded part may be employed. Defect management information contains a combination of kind of information: recorded information or defect information, target area radius, start radius of recorded part, end radius of recorded part, start radius of recording inhibited part due to defect, and end radius of recording inhibited part due to defect, or a combination of flag indicating defect information, target area radius, start radius of recording inhibited part due to defect, and end radius of recording inhibited part due to defect. Additionally, their information may be combined to form management information, and can be used together with the aforementioned addresses.

When user data continuous for a long time such as video or audio data is managed, a position of a recording start time zero may be set as a reference on the medium, and information may be managed based on a recording time with it as a reference. In this case, a combination of recording layer number, recording start time of recorded part, and end time of recorded part, or a combination of recording layer number, target area start time, start time of recorded part, and end time of recorded part may be employed. Defect management information contains a combination of kind of information: recorded information or defect information, recording start time of target area, start time of recorded part, end time of recorded part, start time of recording inhibited part due to defect, and end time of recording inhibited part due to defect, or a combination of flag indicating defect information, recording start time of target area, start time of recording inhibited part due to defect, and end time of recording inhibited part due to defect may be employed. Additionally, their information may be combined to form management information, and can be used together with the aforementioned addresses and the radial positions.

Claims 20 to 22 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. As to each of these claims, the lack of clear antecedent basis for certain recitations has been addressed by this amendment. As amended, it is

believed that each of claims 20 to 22 are no longer subject to this ground of rejection.

Claim 19 was rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,608,715 to Yokogawa et al. This rejection is respectfully traversed for the reason that Yokogawa et al. neither shows nor suggests the invention recited in claim 19 as now amended.

In making this rejection, the Examiner specifically pointed to Figure 23 and characterized the areas TOC_1 through TOC_m as a recording management area. Yokogawa et al. refer to this as “allocation data” for all recorded data in the disk, that is, “the data equivalent to TOC data as used in an ordinary CD.” (col. 14, lines 38–41) As is well understood in the art of optical recording, the TOC (Table Of Contents) identifies the start position and length of the tracks on a disc and is present on all CDs and DVDs. However, a TOC is not a recording management area as used in the disclosed and claimed invention. To make this clear, claim 19 has been amended to more specifically recite the types of information recorded in the recording management information. Specifically, claim 19 recites “a recording management area in which recording layer management information containing at least information indicating recording states and defects of a plurality of areas into which the inside of said recording area is divided is recorded, said management information including target area number, start address of recorded part, end address of recorded part, start address of recoding inhibited part due to defect, and end address of recording inhibited part due to defect”. It is submitted that this recitation clearly distinguishes the recited recording management area from the TOC areas of Yokogawa et al. in both content and function.

Claims 20 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over the patent to Yokogawa et al. in view of U.S. Patent No. 6,850,460 to Ogawa et al. This rejection is respectfully traversed for the reason that the combination of Yokogawa et al. and Ogawa et al. fails to suggest or otherwise teach the claimed invention. Yokogawa et al. is distinguished above.

In making this rejection, the Examiner stated that “Yokogawa et al. do not disclose: in regard to claim 20, that defect management information indicating a defect position of said recording layer is further recorded in the recording

management area of each recording layer; and in regard to claim 21, that the defect management information of said one recording layer is recorded in a recording management area of the other recording layer.” The Examiner pointed to the patent to Ogawa et al., and specifically to col. 12, lines 58–60, and quoted “the rewritable areas of the lead-in area and the lead-out area 204 have a DMA”, and characterized this as “indicating a defect position of a recording layer. Ogawa et al. don’t disclose a detailed explanation of a DMA. That is, Ogawa et al. don’t disclose that defect management information indicating a defect position of the one recording layer further includes a flag indicating defect information (see amended claim 20) and the defect management information of the one recording layer is recorded in a recording management area of the one or more recording layers (see amended claim 21).

Claim 22 was rejected under 35 U.S.C. §103(a) as being unpatentable over the patent to Yokogawa et al. in view U.S. Patent No. 6,751,171 to Ohta. This rejection is respectfully traversed for the reason that the combination of Yokogawa et al. and Ohta fails to suggest or otherwise teach the claimed invention. Yokogawa et al. is distinguished above.

In making this rejection, the Examiner stated that “Yokogawa et al. do not explicitly disclose: in regard to claim 22, that a guide groove of a wobbling shape is formed in at least one track of said recording layer, and the guide groove of the wobbling shape is subjected to track modulation for indicating a track address.” The Examiner pointed to Ohta, citing col. 4, lines 21–30; however, Ohta adds nothing to the combination with Yokogawa et al. that would cure the lack of teaching already noted.

New claims 23 to 26 have been added by this amendment. New claim 23 is dependent on claim 19 and recites “the management information further includes a position of a recording start time zero set as a reference on the medium, a layer number, a recording start time of a recorded part, and an end time of the recorded part, the recording start time and the end time being referenced to said start time zero”. New claim 24 is an independent claim similar to claim 19 but recites “a recording management area in which recording layer management information containing at least information indicating recording states and defects of a

plurality of areas into which the inside of said recording area is divided is recorded, said management information including target area radius, start radius of recorded part, end radius of recorded part, start radius of recoding inhibited part due to defect, and end radius of recording inhibited part due to defect". New claims 25 and 26 are similar to claims 20 and 21 but are dependent on new claim 24. These claims are clearly patentable for the reasons advanced above.

The prior art made of record but not relied upon has been reviewed; however, none of the prior art of record is believed to be relevant to the claimed invention.

In view of the foregoing, it is respectfully requested that the application be reconsidered, that claims 19 to 26 be allowed, and that the application be passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



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